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The Farm Dollar: Reaping More, Keeping Less

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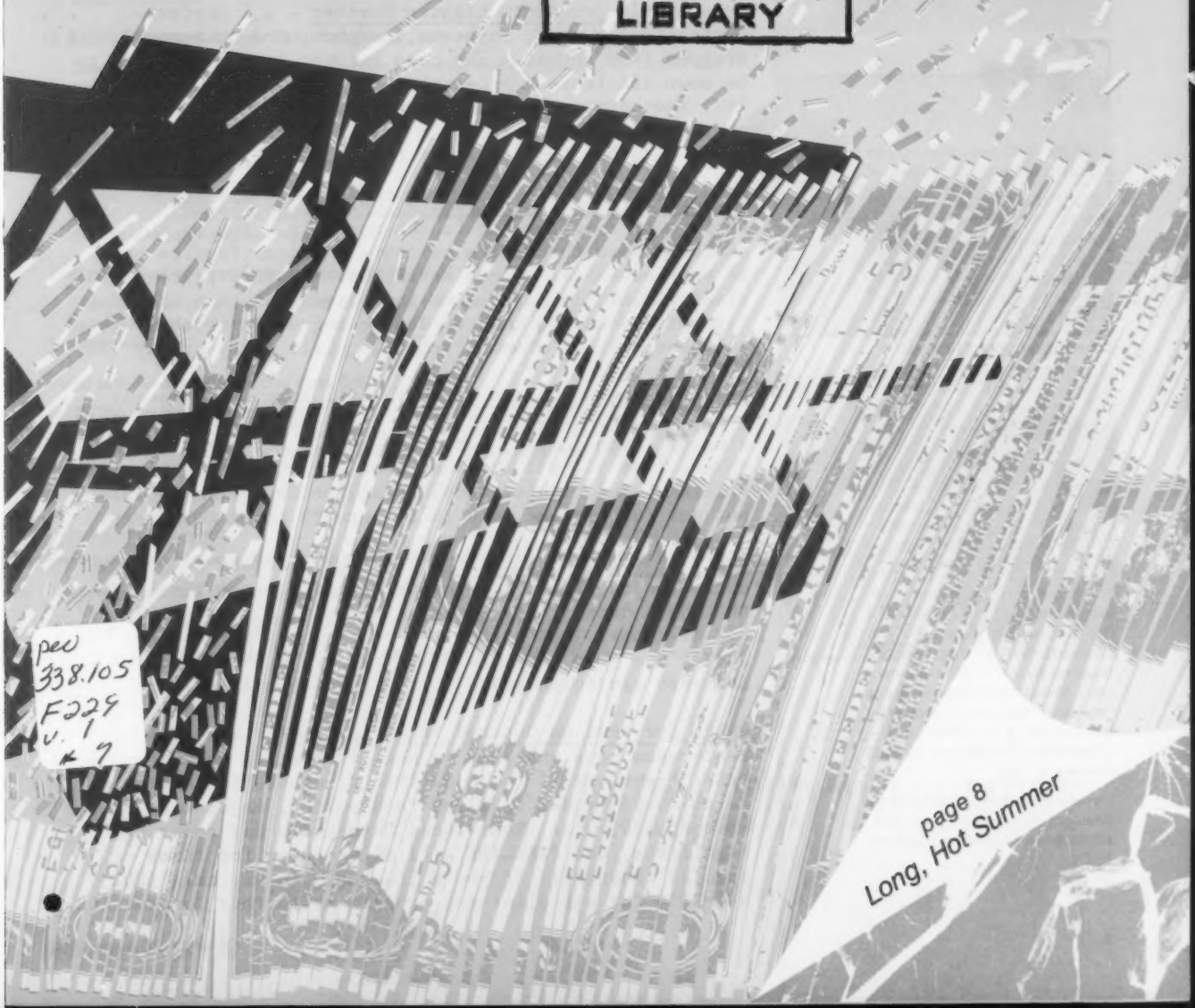

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Long, Hot Summer

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Perspectives

The harsh summer weather has left an uneven legacy of "haves" and "have nots" among crop farmers, while sharply boosting feed costs for livestock and poultry producers. Your income this year and well into next depends a great deal on where you farm and what you raise.

Farmers now harvesting good crops will benefit the most from stronger prices, but weather-reduced yields, withered pastures, and higher feed grain and hay prices spell difficult times for some crop and livestock producers.

Crop supply prospects tighten further . . . September forecasts for corn, soybeans, sorghum, and cotton all dropped from August. The corn harvest is now expected to be down 16% from 1979; sorghum down 33%; soybeans down 19%; and cotton down 20%. Analysts say U.S. feed grain stocks will drop to about 28 million tons by Oct. 1, 1981, quite a tumble from this October's 53 million.

Farmers' prices now outpacing costs . . . Prices received by farmers rose for the fourth month in a row in August, climbing more than twice as fast as prices farmers pay to meet expenses. Since April, farm product prices have risen 14%, while costs have increased less than 4%. But farm prices had to make up for lost ground, so their gains put them only 8% above a year ago while costs are up 13%.

Net farm income pumped up--but still down . . . Recent price improvements pumped some life into this year's sagging net farm income, but not enough. The estimate now ranges from $23-$25 billion, down 20-25% from 1979's $31 billion. But tighter supplies and better prices should put net farm income back on the growth track next year.

Forty billion and counting . . . U.S. farmers rang up an estimated $40 billion in export sales for the fiscal year that just ended Sept. 30--up a whopping 25% from 1979's $32 billion. That's the 11th consecutive sales record, and it's a good bet 1981 will make it an even dozen. Analysts are forecasting in the $40-$45 billion range.

Watch for news on Outlook '81 . . . USDA's annual outlook conference gets underway on Nov. 17 here in Washington, D.C. Experts will focus on 1981 prospects for agriculture: world trade, farm and food policy, major U.S. commodities, etc. Your local farm media may cover the highlights, and FARMLINE will be watching for items of special interest. If you'd like to join us, call (202) 447-3050 for a preliminary program or further information.

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Farmers' 1980 receipts have been higher than ever, but rising expenses have left them with a good deal less than last year. In many cases, those newest to farming have been hit the hardest. Who's hurting, who's not, and what's ahead for next year?

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In the worst runup since 1973, farm production expenditures rose 18 percent last year, with the sharpest gain for livestock transactions—mostly feedlot purchases of feeder cattle. Less than a tenth of all farms did about half of the total spending.

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This summer's dry, scorching weather shriveled both crops and livestock, but farmers who escaped damage may find better prices ahead. By late summer, USDA experts were raising their price forecasts for the new season as supply and demand prospects tightened.

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Remote-sensing satellites and computers that "complain" about the weather may become important new tools for forecasting harvests, keeping track of crop conditions, and monitoring land use.

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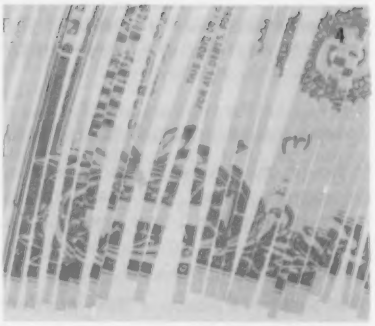
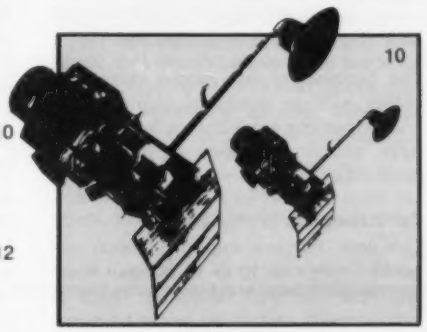
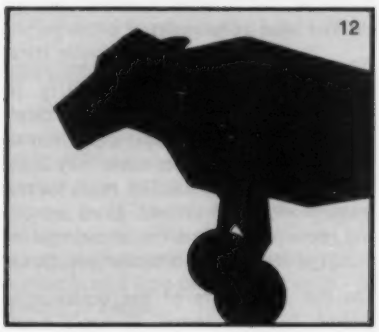
Delivering on a futures contract is seldom the best way out of a hedge, as most experienced hedgers know. They use futures markets to transfer risks, not products.

Food Aid: An Investment that Pays Off 16

Of the top ten cash customers for U.S. agricultural exports last year, almost all once counted on U.S. food aid. Its purpose is to combat hunger abroad, but P.L. 480 has done its share to bring new markets and expanding sales for U.S. farmers.







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The Farm Dollar: Reaping More, Keeping Less

Even without this summer's drought, it would have been a frustrating year for U.S. agriculture, says USDA economist George Hoffman.

The reason: Farmers are keeping less of every sales dollar than they did last year.

Although the figures are far from final, forecasters expect 1980 net farm income to skid to a 3-year low of $23 to $25 billion. That's down about a fourth from 1979's estimated $31 billion.

This summer's pickup in farm prices in response to the hot, dry weather helped some, but not enough to substantially alter this year's picture, Hoffman says.

The problem is that record sales and higher average prices do farmers little good when the extra dollars fail to cover even greater increases in production expenses.

Can't Keep Up With Costs

This year, farmers' total production expenses may rise 10 to 12 percent from last year, Hoffman estimates. That's a stiff increase, and all the worse because it follows right on top of an even higher jump in 1979 when farmers' expenditures rose 18 percent.

Sharply higher costs have taxed most farmers beyond their ability to economize by cutting back or postponing purchases. Fuel expenditures and short-term interest costs may show increases of 30 percent or more for the year, though only modest gains are being recorded in costs for farm-origin inputs (mostly feed and feeder livestock).

On the other side of the equation is gross farm income. Overall cash receipts to livestock and poultry producers are not expected to increase much this year. However, crop receipts may rise by a tenth, and total 1980 receipts for the farm sector will hit a new record. Government payments to producers may also rise.

However, the bottom line is that cash receipts from crop and livestock marketings will not keep pace with production expenses.

The rise in cash receipts for the entire farm sector may total only 4 to 6 percent, with receipts reaching an estimated $137 to $140 billion for 1980, Hoffman says. Adding in government payments and other income items will mean gross farm income of around $155 billion, leaving net income in the $23 to $25 billion range.

Aggregates Aren't For Individuals

Although national net farm income is an important measure of financial returns throughout agriculture, the figure lumps all farmers together, ignoring differences in the well-being of individual farmers, Hoffman says.

Some farmers, for example, lost an entire crop—perhaps representing a whole year's income—to the hot, dry weather that scorched the Plains states, southeast, and parts of the Corn Belt. Many livestock and poultry producers also suffered serious losses.

At the same time, however, other producers who weren't affected by the weather problems benefited from the substantial pickup in market prices. Many will continue to benefit—like those harvesting a bumper grain crop with a record yield this fall—because the deterioration in overall crop prospects should add lasting price strength to several 1980 crops.

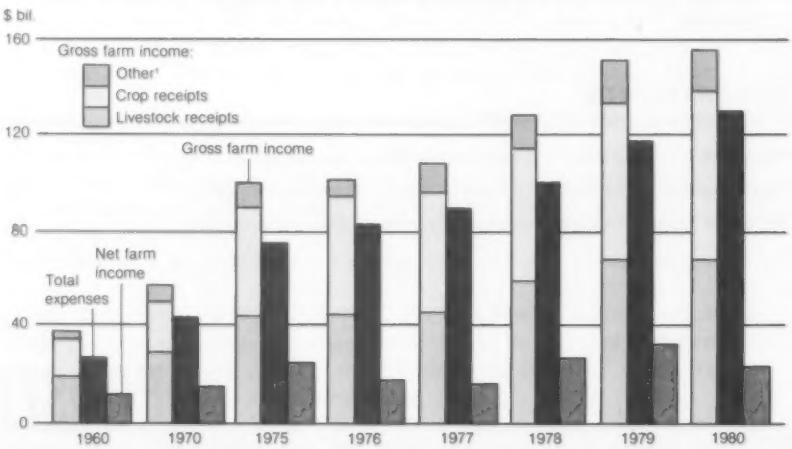
Besides weather, other factors such as commodities produced, tenure and debt status, degree of reliance on purchased inputs, and dependence on off-farm versus farm income should also be considered to determine who's hurting and who's not.

Crops Do Better Than Meat

Among crops, producers of wheat, corn, tobacco, and cotton will probably show the biggest gains in receipts from last year. Modest increases are expected for soybeans, fruits, vegetables, and other crops.

Likewise, the effects of higher input prices vary among crops. Crops that use relatively large amounts of energy have the greatest increases in cash costs—for

Rising Expenses Cut 1980 Net Farm Income to Three-Year Low



¹Includes government payments, value of net change in farm inventories, cash income from such sources as machine hire and custom work, and nonmoney income. 1980 estimated.

Hardest hit are new farmers—especially those in soybeans, hogs, and poultry.

example, cotton, sorghum, and other crops in the southwest use considerable energy for pumping irrigation water.

Similar differences apply to livestock and poultry producers, although—in general—they'll probably not do as well as crop producers in 1980. Production costs are up, and total receipts will show little to no increase this year, Hoffman says.

"The expansion of pork production pushed hog prices this past spring to their lowest levels since 1974. And the recession in the general economy weakened the demand for meat, so higher prices could not be maintained with the record supply," Hoffman explains.

Broiler production has also been high and prices low. Though beef production has been lower than in 1979, the large supply of competing meats held down all livestock prices. Dairy is the major exception in the livestock sector—strong prices for milk have kept dairy receipts substantially higher than last year.

Counting On Off-Farm Jobs

Of course, farm income depends on a number of factors besides the commodities produced. Also, it's not the only measure of a farmer's financial situation. For instance, farm families who count on off-farm jobs for a large part of total family earnings may be less vulnerable to fluctuations in farm income.

A third of all U.S. farms rely on off-farm jobs for more than 90 percent of family income. These farms earn less than $2,500 in annual gross farm product sales, and, altogether, they receive less than 1 percent of all cash receipts going to agriculture. Over half of the farm sector's total income comes from off-farm sources.

Off-farm jobs may be of help in dealing with downturns in the farm economy, though these jobs—if farm-related—can be affected, too, when farmers aren't doing well. Moreover, this year's economic slump isn't confined to the farm sector, and unemployment has increased in many industries.

As Important As Income

A farmer's wealth is another important factor that doesn't show up in net farm income figures. Assets and debts provide a measure of the financial position—and security—of producers.

In recent years, capital gains on farm assets have far outdistanced farm income in adding to the real wealth of

How Farm Income Estimates Are Made

A combination of efforts produces the net farm income estimates issued by USDA's Economics, Statistics, and Cooperatives Service (ESCS).

Throughout the year, agency statisticians collect survey data from farmers and others in agriculture.

The surveys cover crop and livestock production, farm product marketings, prices paid by farmers for production inputs, and prices received by farmers for their products.

ESCS economists use this information along with domestic and foreign supply and demand prospects, weather data, and likely farm production expenses to arrive at a forecast of net farm income for the current and coming year.

As conditions change, or when new information becomes available, the forecast may be adjusted.

Once a year, a special survey is conducted across the country to gather information on just how much farmers actually spent for everything from fuel to fertilizer and feed to fencing (*see story on page 7*).

The results are published each summer covering the preceding year and assist economists in truing up net farm income estimates.

Most of this year, for example, USDA economists were estimating that farmers' 1979 expenses had risen 16 percent from 1978, but the survey showed an 18-percent increase. This contributed to some downward revision in the estimate of 1979 net farm income from a little over $33 billion to about $31 billion.

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farmers. Although these gains don't pay the bills directly, the additional equity created often becomes the collateral for credit to meet current production expenses, to finance farm expansion, and to invest in new equipment and machinery.

Farm asset values tripled during the 1970's, reaching around $920 billion this past January. Three-fourths of this value is in real estate.

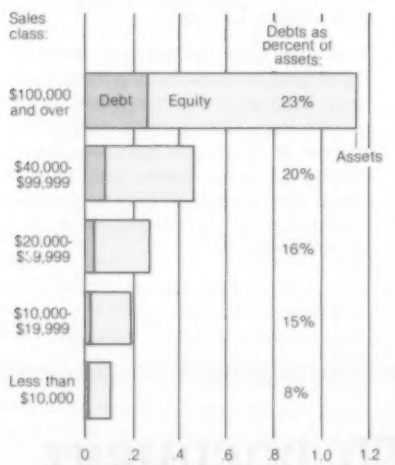
Asset values have probably increased again this year, though at a slower rate than in the recent past. Farm debt, on the other hand, has likely grown at a faster rate.

Again, however, situations differ considerably among producers. In 1978, about a third of all farm assets were controlled by 6 percent of the farms with annual gross sales of $100,000 and over. The bottom third of all farms in terms of sales controlled only 12 percent of total assets.

On the other hand, larger farms tend to have higher debts in relation to their assets than small farms. Debts amounted to less than 10 percent of all assets for small farms in 1978 but over 20 percent of assets for large farms—those with sales of $100,000 and over. Also, larger producers are less likely to have off-farm income coming in.

Consequently, even small changes in farm prices and income can give large operators cash flow problems in meeting debt payments and other farm and living expenses, although their wealth in assets may provide financial security over the long run.

Top Sellers Hold Largest Asset Wealth But Largest Debts, Too



[1]1978 data.

Tenure Question

The effect of reduced cash flow also depends on the tenure of the farm operator. For example, a well-established farmer, who bought when land prices and credit rates were lower, is in a better cash flow position and more able to handle a debt load in lean times; this farmer can get credit more easily to cover increased production expenses.

A newer farmer, however, who bought land more recently at higher prices and higher interest rates, has a high debt-equity ratio. It's harder for this farmer to get additional credit for production inputs, and there may be more cash flow problems.

Considering all the variables, among those hardest hit this year have been new entrants into soybeans, hogs, or poultry who use a high proportion of purchased inputs—especially if they don't own their land and don't have outside income.

Farmers who raise corn, wheat, cotton, or tobacco have been relatively better off, especially if they are well-established producers with a large equity base.

What's Ahead?

Is the 1980 drop in farm income a short-term problem, or is another decline next year just as likely?

"The sharp decline of 1980 appears to be an aberration in a trend, and it seems even worse because it tumbled from the relatively high net farm income of last year," Hoffman says.

"There were a lot of unusual circumstances which led to this year's situation. Last year's harvests resulted in records for six out of the 10 major crops—corn, wheat, soybeans, cotton, barley, and sorghum—an accomplishment unmatched since 1958. The bumper crops tended to keep this year's price increases modest."

In the long run, net farm income has been trending up. Moreover, each year there have been fewer farmers sharing the total. In the context of this trend, the drop in both per-farm and total net farm income in 1980 is clearly an exception.

Current prospects, though highly uncertain, suggest an improvement in net farm income in 1981. Total meat production should be down from this year's record levels, and prices should be higher. With smaller crops and tighter grain and oilseed supplies, farm prices could average sharply higher than this year.

U.S. exports should continue strong, at least matching and probably exceeding this year's record value. There may also be some recovery in the general economy, which could stimulate domestic demand for red meats.

Another potential plus—especially for the longer term—would be the use of corn and other crops for energy products, such as alcohol fuels. Though limited now, such alternative uses could eventually boost farm income.

At the same time, however, farmers' production costs will keep rising. Energy prices will continue to outpace other inputs, and this will keep upward pressure on fertilizer prices. Land prices will also increase. Interest rates will depend on the underlying inflation rate in the general economy, which may remain relatively high for the next several years.

A Closer Look at Farm Expenditures — One Year Later

In the worst runup since 1973, farm production expenditures rose about 18% in 1979 to $135 billion, according to recent results of a nationwide survey of 8,500 farmers and ranchers by USDA's Crop Reporting Board.

That may sound like old news at a time when farmers and forecasters are already looking cautiously ahead to 1981, but the record books on past years aren't closed until all the facts are in.

The annual Farm Production Expenditure Survey, in which farmers report their actual outlays during the past year, provides a detailed account of how the money was spent as well as a crucial check on the expense side of USDA'S farm income calculations (see accompanying box).

Cattle Costs Escalate

The sharpest gain in 1979 expenditures was for livestock and poultry purchased mostly from other farmers. The total was $21.5 billion, 58 percent more than the $13.5 billion in 1978.

A closer look finds that most of farmers' spending in this area was for cattle—largely purchases of feeder cattle (feedlot operators are classified as farmers). These expenditures reached $17.7 billion, up more than $7 billion. The major reason: Prices were substantially higher.

For farm services, including rent, custom hired work, veterinarian services, insurance, marketing expenses, and other related business costs, the bill came to $19.4 billion, a $2.6 billion increase. Rent accounted for 53 percent of the total, slightly less than the year before.

Feed Slips to Third

Feed, which for the last 4 years was the biggest expenditure item in the farm sector, dropped to third place, with a total bill of $18 billion, up 9 percent.

Seeds, plants, fertilizer, and agricultural chemicals added up to $15.5 billion. A year before, the total had been $12.9 billion.

Farmers shelled out $15.2 billion for automobiles, trucks, tractors, and other machinery (before trade-in adjustments), compared with $13.5 billion in 1978.

Interest on debt cost producers $9.2 billion last year, a 23-percent increase from 1978's $7.5 billion.

As expected, energy also carried a much higher price tag—up 26 percent to $8.2 billion. Gasoline expenditures were $2.8 billion and diesel fuel $2.3 billion—each up a third—while electricity advanced 18 percent to $1.6 billion.

A relatively small number of large farms did most of the spending. For example, farms with gross annual sales of $200,000 or more represented only 7 percent of the sample farms surveyed but accounted for almost half of all expenditures reported.

The average expenditure per farm in 1979 came to about $58,000, a 20-percent rise from 1978's $48,000. The percent increase per farm is larger than the overall 18-percent gain in farm sector expenditures because of the slight decline in the number of farms between 1978 and 1979.

How Survey Results Affect Income Accounts

Farm Production Expenditure Survey results help true up USDA's net farm income estimates for the previous year and establish a base for expense and net income forecasts for the current and the coming year.

However, the survey data cannot be directly applied to USDA's farm income accounts. Many differences exist between farmers' *expenditures* as reported in the survey and farm production *expenses* reported in the farm income accounts.

One big difference is that the farm income accounts consider agriculture as a separate sector of the U.S. economy, so that transactions between producers are offsetting.

In other words, when one farmer purchases feeder livestock from another, the first farmer's expenditure is the second farmer's income. While the cost to the first farmer is reported in the expenditure survey, neither the expenditure nor the income is included in the farm income series because they cancel each other out.

Another major difference between *expenditures* in the survey and *expenses* in the income accounts involves the calculation of capital outlays. For example, when a farmer buys a new combine or builds a new confinement shelter, the entire cost is reported in the year of purchase in the expenditure survey.

However, in the income accounts, the investment will be depreciated over its useful life, so that only a percentage of its cost—along with interest and insurance—will be considered as an expense in the year of purchase and each year throughout the depreciation term.

When data from the latest expenditure survey went into the computers, the figures were recalculated based on these and other differences. The results put 1979's total farm production expenses at $119 billion, some $16 billion less than the $135 billion expenditure total reported in the survey.

The expense figure still came as a surprise because economists had previously estimated the overall increase in expenses at around 16 percent—rather than 18 percent—from 1978's $101 billion.

A Sizzling Summer Singes Crop Prospects

As this year's harvest swings into full gear, American farmers and their customers from New York City to Tokyo are waiting to see how much the summer heat and drought left—and at what prices.

While final production figures on spring-planted crops won't be in until January, late summer reports indicated severe losses to corn, soybeans, sorghum, and cotton crops—especially in major production areas of the Great Plains, the Corn Belt, and the southeast:

- The corn crop was expected to be 6.53 billion bushels, still the third biggest ever, but 10 percent less than mid-summer expectations.
- Sorghum was pegged at 547 million bushels, down about a third from last year. Total feed grain production—corn, oats, barley, and sorghum—was expected to be down 17 percent from last year's record.
- Soybean production was expected to drop 19 percent from the 1979 crop to 1.83 billion bushels — still the third largest U.S. harvest.
- Hay production was expected to drop 15 percent from last year to 124 million tons.
- Cotton output was forecast at 11.7 million bales, down 20 percent from 1979.
- All wheat production should reach a record 2.35 billion bushels, 10 percent more than last year. However, most of this—1.85 billion bushels—is winter wheat which wasn't affected by the harsh summer. The durum crop is off 4 percent from 1979, and other spring wheat is down 13 percent because of poor yields.

Of course, factors other than weather—such as changing planted acreage and fertilizer inputs—also affected production of many of these crops.

All Signs Boded Well

The dry, scorching weather has made 1980 a year that many farmers would like to forget. But early this year, all weather signs boded well.

Unlike patterns of earlier droughts in the mid-1950's and mid-1930's, the 1980 crop started with excellent moisture supplies everywhere except the northern Great Plains and part of west central Texas, thanks to winter storms and heavy rainfall.

Then a high pressure ridge formed over the Canadian Rockies, diverting the primary jet stream—and associated storm systems—into Alaska before turning back to the U.S. The secondary jet stream was shifted south across the southwest. The result: storms were blocked from the Great Plains.

By mid-June, the initial blocking ridge broke up, as rain finally swept over the Great Plains. But another formed over the south-central states, lasting until mid-July. Drought settled over the southwest, damaging sorghum, cotton, and corn.

The heat wave spread eastward, singeing some crops in the southeast, and severely damaging crops in the central Plains.

In late July, two frontal systems brought rain and cooler temperatures to the Great Plains, Corn Belt, and Atlantic Coast to break the drought. But relief came too late for many farmers.

As of July 30, 561 counties were eligible for FmHA drought emergency loans, and another 370 counties were marked for Agricultural Stabilization and Conservation Service emergency feed programs.

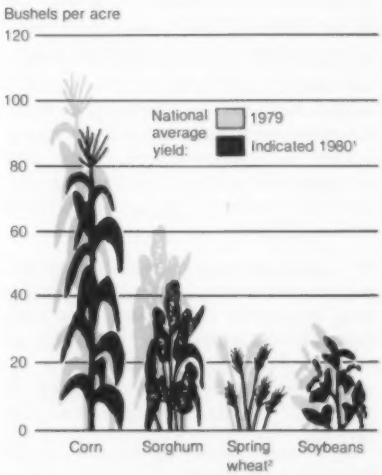
Prospective Supplies Tighten

However, farmers who escaped drought damage may find much better prices ahead as prospective crop supplies have tightened markedly.

Here are USDA's late-summer supply-demand expectations for the new crop season:

- Feed grain demand for 1980/81 was pegged at around 219 million metric tons, against a forecast 194 million ton 1980 harvest. This would slice stocks from 53 million tons at the beginning of this marketing year to a projected 28 million tons at the end.
- Soybean demand was also projected to exceed production, with total demand set at about 54 million metric tons against 50 million metric tons of output.

Crop Yields to Drop Sharply From Last Year



¹As of mid-September.
²Excluding durum.

Prospective crop supplies have tightened markedly.

• Cotton production and demand were seen in near balance, with 11.7 million bales of production matched against 12.2 million bales of demand.

Better Prices Ahead?

What will be the effects of these tightened supplies on prices?

By late summer, USDA experts were pushing up their farm price estimates as the supply and demand situation tightened. For example, the 1980/81 season average corn price forecast was revised from $2.45-$2.85 in July to $3.00-$3.50 per bushel.

Soybean prices of $5.63 per bushel in April jumped to $6.97 in July, and later conditions suggested an average farm price of $8.20 for the marketing year which began on September 1. However, economists say the season average could range anywhere between $6.95 and $9.45.

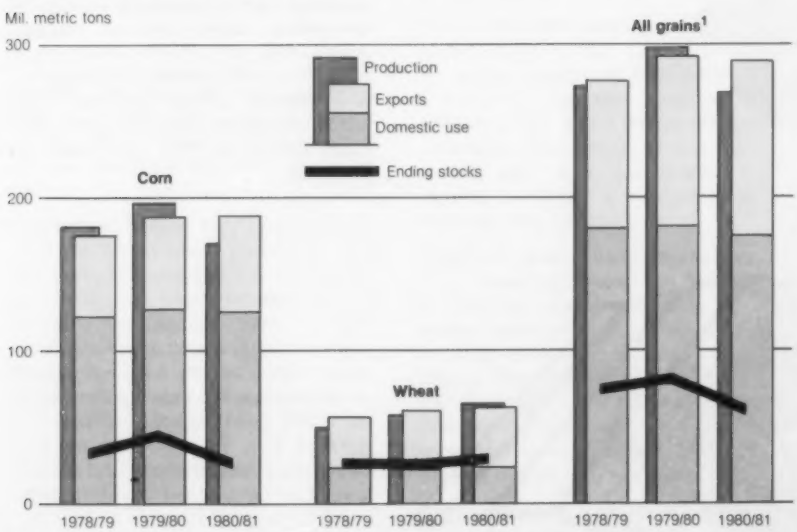
Farm prices for wheat were projected between $3.90 and $4.25 per bushel, compared with $3.82 last season.

While the exact figures are still up in the air, they could be strengthened further if worldwide shortfalls occur, increasing export pressures.

Livestock production may be thrown out of kilter by higher than expected feed grain prices resulting from the drought. Nonfed steer and heifer slaughter will increase because of large feeder cattle supplies and drought-damaged range throughout many overwintering areas.

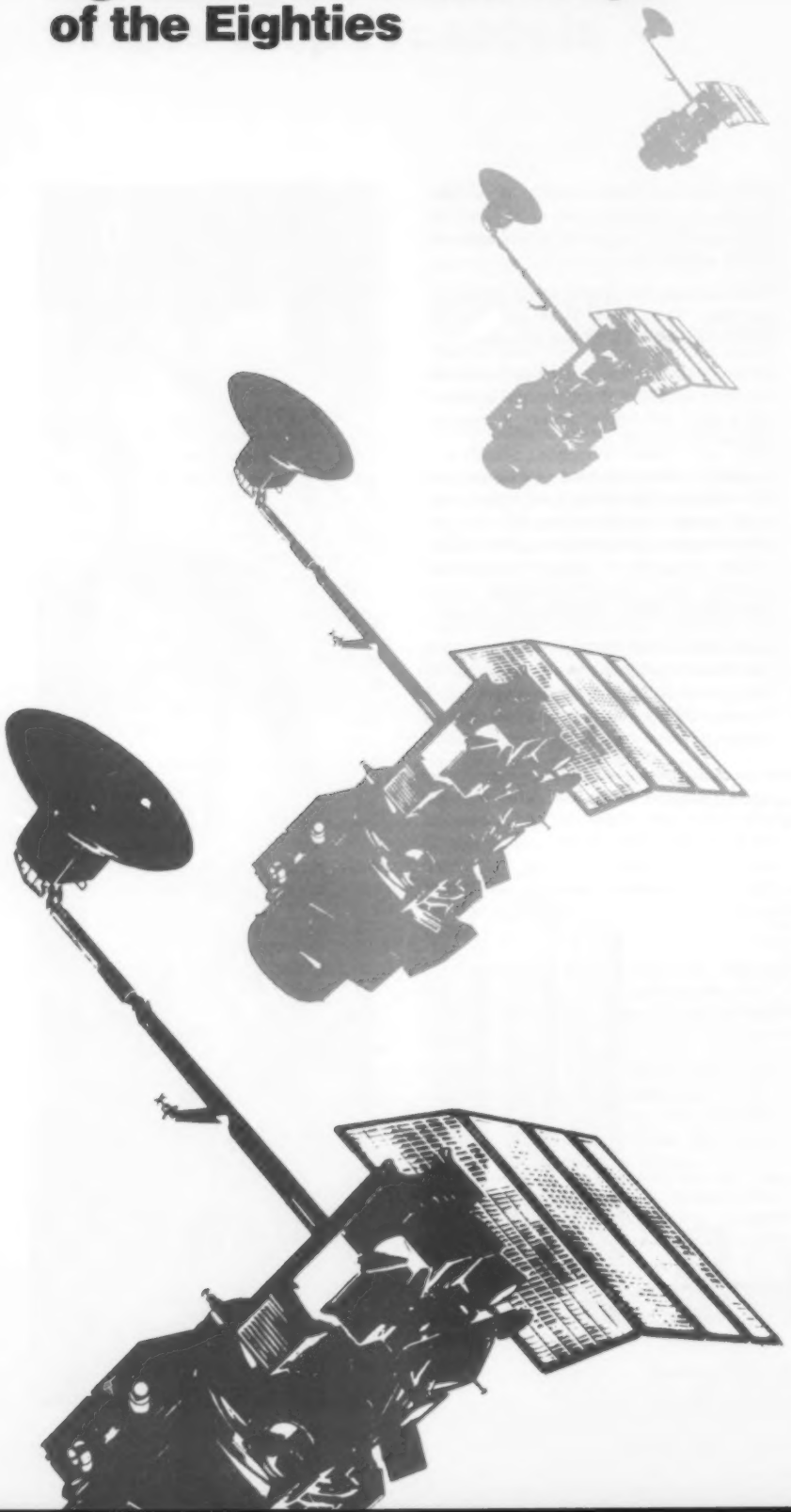
Beef production through year's end will be near or slightly above year-earlier levels. Fed cattle prices may be near $75 in late 1980, as supplies of competing meats decline.

Decline in Grain Stocks Predicted as Supply Prospects Tighten for Weather-Damaged 1980 Crops



[1]Includes corn, sorghum, barley, oats, wheat, rice, and rye. 1979/80 estimated. 1980/81 projected.

AgRISTARS for the Crops of the Eighties



Satellite sensors that monitor U.S. and world crops and computer models that "complain" about the weather are on their way to becoming important new tools in agriculture's growing information arsenal.

"American agriculture is stepping into the space age, with a direct benefit for U.S. farmers," says Bill Kibler, the head statistician of USDA's Economics, Statistics and Cooperatives Service (ESCS).

The research effort to gain timely information about the earth through remote sensing by satellite and special technology on the ground is called AgRISTARS (Agriculture and Resource Inventory Surveys Through Aerospace Remote Sensing).

Begun this year, the 5-year, $300 million project involves USDA, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and other experts on crops, weather, and satellites.

The overall purpose is to explore ways to keep track of crop conditions, forecast harvests for major commodities, and monitor land use and renewable resources. Using satellite imagery, AgRISTARS will monitor wheat, barley, rice, corn and soybeans in both the U.S. and several foreign countries. Other crops, monitored only in the U.S., will include cotton, sorghum, sunflower, and potatoes.

USDA has the leadership role in five of the eight AgRISTARS research projects: Early Warning/Crop Condition Assessment, Domestic Crops and Land Cover, Soil Moisture, Renewable Resources Inventory, and Conservation and Pollution. NASA is responsible for two: Foreign Commodity Production Forecasting, and Supporting Research, which involves new sensing techniques. NOAA has the lead responsibility for the Yield Model Development project.

Forty Year History

USDA's interest in remote sensing spans more than 40 years. In the 1940's, remote sensing efforts used cameras mounted in airplanes to get photos of U.S. land areas. In 1972, the first Earth Resources Technology Satellite, now called LANDSAT 1, was launched into orbit.

In 1974, NASA and USDA began an information evaluation project called LACIE (Large Area Crop Inventory Experiment) designed to estimate wheat production worldwide.

If anticipated AgRISTARS technology had been operational several years ago, it might have saved U.S. farmers some money.

In 1977, for example, the Soviet wheat shortfall was not completely apparent until 5 months into the marketing season. When wheat prices jumped, it was too late for many U.S. farmers to cash in.

Ironically, an August 1977 LACIE experiment put Soviet wheat production at a level within 6 percent of the official production figures finally released by the Russians in January 1978. A later satellite-based estimate varied by only 1 percent from the official Soviet figure. These findings were not reported at the time, according to Rich Allen, ESCS statistician at work on AgRISTARS, because LACIE procedures were not yet considered credible by USDA analysts.

However, because LACIE and other remote sensing research demonstrated the possibility of improving crop production estimates, USDA saw a clear need to build on this experience and expand the scope of aerospace technology research.

Clouds Get In the Way

AgRISTARS offers Early Warning/Crop Condition Assessment investigations for several crops and areas in the U.S. and in seven foreign countries that will permit USDA to see changes in the quality and production of economically important crops at various stages of development.

In making crop condition assessments, AgRISTARS will develop techniques for merging satellite data with information collected by ground observers and from weather stations to enhance accuracy, timeliness, and reliability.

Bird's-Eye View By Satellite

AgRISTARS' bird's-eye view of the world comes from the vantage point of a LANDSAT satellite.

Three LANDSAT satellites have been launched since 1972. LANDSAT 1 is no longer operational, but LANDSAT 2 is working well, after a respite, collecting U.S. and a limited amount of foreign data. LANDSAT 3 is "extremely sick," according to latest reports. LANDSAT 4 is expected in orbit by early 1983.

LANDSAT, averaging 600 miles overhead, does not photograph the crop or land but measures the solar energy reflected from individual crops to form an identifiable signature. These resulting measurements are transmitted to ground stations as digital information which is converted by computer to an image of what the satellite observes.

Each image from a LANDSAT satelite covers 100 miles on each side and is reported every 18 days.

Satellite information alone has limitations: clouds get in the way, for instance, blotting the image. But a combination of satellite information supplemented by ground observations provides "the best information we can get," according to Allen.

For example, data from LANDSAT 2 and 3 went into the mix to develop the official planted crop acreage estimates for the 1978 Iowa corn and soybean crops issued in January 1979 by USDA's Crop Reporting Board. Kansas wheat will be included for 1980.

The AgRISTARS experts are reviewing LANDSAT satellite and meteorological data for the following countries, crops, and conditions: corn in Argentina; the winter snow pack in Afghanistan; wheat and pasture in Australia; soybeans in Brazil; winter wheat in China and USSR; winter grains in India; water reserves in Mexico; and soybeans in Paraguay.

Computer Crops

What about other AgRISTARS research? Already models are being tested that "grow" a crop within a computer according to actual field conditions.

For example, a computer "corn crop" is being grown. The computer is fed daily weather data, environmental, and plant characteristics to represent growing conditions as an indication of yields for specific regions of the country.

Stress situations, like high temperatures or lack of moisture, affect the computer's "crop," and it can issue alerts before any real crop damage becomes apparent in farmers' fields.

Another AgRISTARS project aids in conservation and pollution studies by estimating soil moisture over large areas. This work will help farmers plan irrigation.

Delivery: Most Futures Hedgers Know Better

This is the third article in a special FARMLINE series designed to provide more information about futures markets and how they work.

Although a good understanding of futures markets and their use can prove valuable, this series is not intended to recommend hedging as a marketing strategy. Hedging has its risks, as well as benefits, and successful hedging usually requires considerable knowledge, time, and skill.

Ask some farmers about hedging and they'll comment on how hard it would be to make delivery under a futures contract.

However, as Allen Paul, a USDA economist who studies futures markets, points out, delivery is usually avoided by experienced hedgers. They typically lift their hedges through offsetting trades—buying back the same number of contracts they sold or selling the same number they bought.

Making delivery on the futures contracts is seldom the most efficient way out of a hedge, particularly for the farmer, Paul says. He notes that futures markets are designed to transfer risks, not products.

The contracts provide for delivery so that cash and futures prices will be linked together. Normally, just the threat of delivery is enough to accomplish that goal. Deliveries against agricultural futures contracts usually amount to less than 5 percent of the average number of open positions reported (contracts that have been entered into and not quickly offset).

"Futures markets are designed to transfer risks, not products."

Delivery is Exception, Not Rule, in Futures Trading

Contract	Average open positions in 1979[1]	Initial deliveries[2]	Percent settled by delivery[2]
Live cattle[3] (40,000 lbs.)	71,000	6,306	8.9
Live hogs[3] (30,000 lbs.)	26,000	398	1.5
Wheat[4] (5,000 bu.)	243,000	5,873	2.4
Corn[4] (5,000 bu.)	837,000	12,744	1.5
Soybeans[4] (5,000 bu.)	594,000	18,154	3.1

[1] Rounded to nearest thousand. [2] Excludes commodities redelivered against other futures commitments. [3] Chicago Merchantile Exchange. [4] Chicago Board of Trade.

For the farmer who has the product on hand, delivery on a futures contract can appear to offer considerable profits when the futures price is well above the local cash price. But nine times out of ten those "attractive" delivery opportunities are not all that appealing when viewed up close, Paul says.

Cost of Transporting

One reason is the cost of transporting the product to futures delivery points. They're generally located at a major cash market for the product, which puts them a short haul away for some producers but a good distance from many others. Of course, the nearer a local cash market is to a futures delivery point, the closer the two prices are likely to be at the contract maturity date.

In the case of cattle and hogs, the delivery points are among the key livestock marketing points throughout middle America, since this area produces the largest proportion of the nation's livestock.

The cotton futures market specifies delivery at the key warehousing and marketing points for the largest U.S. cotton regions. Kansas City is the delivery point for hard red winter wheat, and Minneapolis and Duluth for spring wheat. The frozen orange juice contract requires delivery at regulated warehouses at or near Florida processing plants.

Critical Location

The location of the delivery points is critical because the availability and cost of transportation and storage affect the ability to deliver a commodity. Anything that affects delivery also affects futures prices.

For example, Chicago's changing role in the marketing system created a potential delivery problem for wheat and corn. As the main marketing flow for grains shifted from Chicago and nearby areas—that flow now goes down the rivers and through Gulf ports—it became unprofitable to build new elevators there. Warehouse space has actually declined slightly—all at the same time that trading volume on Chicago contracts has sharply increased.

The dilemma was the lack of an obvious alternative to Chicago as a delivery center. Little grain storage space exists anywhere on the rivers (except at St. Louis, where it is tied to processing facilities and not really available for public storage). Many elevators are in New Orleans, but they are export loadout facilities, geared to high turnover rather than storage.

Look again. Close up, most "attractive" delivery opportunities aren't all that appealing.

Toledo Selected

After wrestling with the problem for years, the Chicago Board of Trade finally selected Toledo as an additional delivery point. Toledo was picked because it is also a Lake port, with a basis very similar to Chicago's, and because it had large and growing facilities built to store the region's grain and soybean crops during the winter freeze on the Lakes.

The addition of Toledo nearly doubled the available warehouse space, decreasing the chances that transportation tieups or warehouse strikes would affect futures prices.

Even the addition of Toledo, however, did not prevent problems in the March 1979 Chicago wheat contract.

Four days before trading was due to expire on the contract, the Commodity Futures Trading Commission (CFTC), which regulates futures markets, suspended trading due to the threat of a squeeze. A few long traders (those who had contracted to buy the commodity) held contracts calling for deliveries exceeding three times the deliverable supply.

The CFTC cited the congestion of Chicago and Toledo elevator space with corn and soybeans and the shortage of transportation as factors contributing to the threatened manipulation.

Distant Wheat

These events were accompanied by extremely strong prices for the March wheat contract, giving the appearance of a good profit opportunity for farmers to deliver wheat. But the only available wheat of a deliverable type was a long distance from Chicago.

It's likely that additional wheat could have been delivered only if it had been trucked from Minneapolis, with the trucks back-hauling corn to make room in the elevators for the wheat.

This would obviously have been costly—especially since the corn would have been taken further from its eventual markets in the process.

Paul suggests this illustrates the usual trouble with the tales of high-profit opportunities in futures deliveries. On closer inspection, it turns out that the price was attractive because delivery was difficult.

The difference between the futures price and a farmer's local cash price will usually reflect the additional costs, requirements, and difficulties of delivery on futures, so Paul strongly suggests that offsetting contracts is the way for most producers to go.

Avoid Delivery Months

In fact, says Paul, many experienced hedgers avoid delivery months altogether. They find they get a more consistent basis by placing their hedges on contracts maturing a month beyond their expected cash market transactions, or they roll their hedges forward into the next option just before the delivery month starts.

Even in the best of times, delivery against a futures contract often carries more problems than delivery to normal cash buyers. That's because a futures

Farmer Delivery Points Located on Main Shipping Channels and at Major Cash Markets[1]

[1]Delivery points shown are for live cattle, feeder cattle, and live hog contracts traded on the Chicago Merchantile Exchange; corn and soybean contracts traded at the Chicago Board of Trade; wheat contracts traded at the Chicago Board of Trade (Chicago and Toledo delivery points), the Minneapolis Grain Exchange (Minneapolis and Duluth-Superior), and the Kansas City Board of Trade (Kansas City); and cotton contracts traded on the New York Cotton Exchange.

[2]Approval is pending on Greeley as a delivery point for live cattle.

contract's terms, other than price, are highly standardized and in many ways inflexible.

It has to be that way, or no one would dare take a position 6 or 12 months out. The contract leaves no room for delivery details to be worked out by buyer and seller (they don't even know each other's names).

Usually, the product delivered is not the precise quality the buyer would order, it is not delivered where and when the buyer needs it, and the payment terms are not what the buyer would select.

Contract Is Compromise

The futures contract is usually a compromise: the most commonly available grade in a standard-sized batch, delivered to some place where such things are frequently traded.

The futures contract is also buttressed with detailed specifications, fixed conditions of delivery, and third-party inspections. If more than one grade is deliverable, there may be fixed differentials that may or may not reflect the market at delivery time.

All of these problems associated with delivery on a futures contract are compounded by the fact that the market tends to price the cheapest available item that is eligible for delivery.

If there is a grade of cotton available for delivery that the futures contract values more highly than the cash market, the cotton will tend to be delivered on futures—and the current bids for cotton futures contracts will reflect that. If the cash market is heavily discounting No. 3 corn, that will tend to depress the price of corn futures.

Inflexibility Problem

The inflexibility of the futures contract can lead to occasional distortion of the futures price if there is a warehouse strike, transportation tieup, or a shortage of USDA graders (so the cattle might have to stand overnight).

The futures exchanges try to minimize such problems through good contract design. Each contract must also be approved by the CFTC, which does its own analysis and evaluation. But still there are occasional problems.

A bad situation is lack of enough delivery capability. If that happens, then the local cash and maturing futures prices will not converge in a normal way and the longs (those who have contracted to buy the product) can force the shorts (those who have contracted to sell) to pay a high price to offset their contracts.

That's almost always a delivery month phenomenon, Paul says. However, another bad situation for a futures contract may be terms that are too permissive of what can be delivered and where—in which case few will want to take the long side of the contract and the futures market will gradually disappear.

Exceptions to the Rule

USDA economist Allen Paul suggests that farmers who want to lift their hedges should generally plan to offset rather than deliver unless:

- They normally market their products at a regular futures delivery point.
- They produce an item that matches the deliverable item specified in the futures contract right down to size, grade, and weight, or any other specifications.
- They are intimately familiar with the special requirements of futures delivery and any special costs associated with it.
- They have the time to monitor the futures market intensively on a continuing basis.

Most producers, Paul concludes, shouldn't look at the futures market as a delivery opportunity. Its real value lies in the market information and the hedging opportunities it provides.

World Update

Competitor Becomes Better Customer

Despite a late-summer improvement in Canada's grains, crop shortfalls have forced heavier than usual buying forays south to obtain U.S. feed grains.

Canada's wheat supplies in late summer were down 15 percent from a year ago. And feed grain supplies were off 13 percent.

So, to maintain their livestock herds and make sure they can fulfill their own overseas customers' orders, the Canadians have stepped up import license issuances above the normal volume of 600,000 to 700,000 tons purchased annually from us.

They may also be shopping for soybeans from the U.S. Yields per acre are off because of drought, and Canadian farmers in the spring cut oilseed acreage sharply in favor of grains in light of the much higher prospective prices for them.

Besides drought, Canadian farmers shared another concern with their U.S. neighbors: decreasing net farm income. It may fall 16 percent.

Record Sales Further South

U.S. farm product shipments to Latin America this year are rising sharply, reflecting disappointing crops in most of Latin America's countries and less competition from Argentina.

For the year ending October 1, U.S. exports to Latin America could top $5 billion. Wheat shipments, alone, may equal the record 1978 volume of 6.8 million metric tons.

Volume exports of several other U.S. farm products to Latin America may also set records for the period: oilseeds and meals, vegetable oils, meats and preparations, and fruits and vegetables.

But the greatest rise in exports has been in corn and grain sorghum, sold mainly in Mexico, more than doubling the volume of a year ago.

Coping With Less, Soviet Style

Their own poor 1979 crops, and the restriction on buying U.S. products, have forced the Soviets to adjust their feed-livestock economy.

- They drew down their reserve grain stocks, and searched the world for available grains and oilseeds, often paying premium prices. But during the first half of 1980 they were still 10 percent short of their feed grain requirements.
- Accordingly, they cut livestock feeding, slaughtered lighter-weight animals, and allowed herd expansions. Soviet statistics listed hog numbers in August below where they were in either 1978 or 1979, while cattle numbers remained barely above year-ago levels. The rate of growth of poultry flocks was the lowest of the past 6 years.
- Soviet meat output on state and collective farms was down 3 percent during the first seven months of 1980, and milk output fell 4 percent.
- While meat and butter may be available to Muscovites who can stand in line long enough, doing without is frequently the only alternative in provincial towns and cities. Shortages of meat and dairy products have figured prominently in the unprecedented reports of strikes and work stoppages in Soviet motor vehicle plants in outlying areas.

Soviet grain production this year will probably fall far short of their announced goal of 235 million tons. And if output rises as forecast—about 30 million tons—the Soviets may import only a few million tons less than last year as they strive to rebuild stocks.

The accompanying table shows how the Soviets fared in grain output in recent years, as well as their import levels.

Soviet Grain Output To Rise, But Without Much Impact on Imports

	Production	Imports
	million metric tons	
1975	140	26
1976	224	11
1977	196	19
1978	237	16
1979	179	31
1980 (est.)	210	28

Iran Shops At Other Ports

Iran is apparently trying to write off the U.S. as a supplier of farm and food products—a hard task, considering America's dominant role in world agriculture.

Nevertheless, economist Michael Kurtzig reports they are largely succeeding. He adds that, in the process, the Iranians are experiencing shortages of foods they had seen on shelves before their internal upheaval began, important items among these are meat, poultry, and eggs.

Who is supplying Iran now? Kurtzig lists the following:

- Australia, primarily, for wheat, with Argentina, Romania, and Western Europe supplementing.
- Thailand, Pakistan, and Dubai for rice, although a considerable amount of U.S. rice ends up there after going to other countries in the Persian Gulf.
- Australia, Canada, and France for barley.
- Brazil, Spain, France, and the Netherlands for vegetable oils.

Food Aid: An Investment that Pays Off

The phenomenal growth in U.S. farm exports—from $7 billion in fiscal 1970 to about $40 billion in 1980—is, at least partly, a graphic example of how helping others can be a good way of helping yourself.

Of the top ten cash customers for U.S. agricultural goods last year, almost all are past recipients of U.S. food aid. Scores of other major foreign buyers were also once dependent on U.S. food aid.

The U.S. has always been generous with food. Under the Agricultural Trade Development Act of 1954, commonly called Public Law 480 (P.L. 480), the value of U.S. food aid through fiscal 1979 totaled $29 billion. On an annual basis, it has ranged from $385 million in 1955 to a record $1.6 billion in 1965 and averaged about $1.1 billion annually for the last 3 years.

Wheat exports have accounted for 40 percent of the program's value, followed by rice at 11 percent. Other major commodities exported under the program have been feed grains, wheat flour, soybean oil, tobacco, cotton, and nonfat dry milk.

More Than One Hundred

Almost every country in the world, at one time or another, has received P.L. 480 shipments, although 80 percent of the total program value has gone to developing countries. India, Pakistan, South Korea, Egypt, Indonesia, and South Vietnam received over 60 percent of the total value shipped to more than 100 developing countries since 1955. India, the leading recipient, received 20 percent of all P.L. 480 exports.

P.L. 480 shipments have also gone to about 30 developed countries. Of this aid, two-thirds went to Yugoslavia, Spain, Poland, Italy, Japan, Portugal, and Greece, mostly during the late 1950's. During the last 10 years, except for Portugal, no developed country has received U.S. food aid.

The P.L. 480 program was created with the U.S. farmer in mind as a means to dispose of surpluses, mainly grains, to countries that couldn't afford to buy.

However, in 1966, P.L. 480 underwent a major policy change. That year the grain harvest in India was reduced drastically by bad weather. At the same time, India's population increased by an estimated 12 million. The country was on the brink of starvation.

Although U.S. stocks were also low, Americans felt obligated to assist India and any other country in a similar predicament. The Food for Peace Act of 1966 amended P.L. 480 and omitted references to U.S. surpluses, putting the emphasis instead on promoting economic development abroad and combating world hunger and malnutrition.

Credit Sales To Care Packages

P.L. 480 includes several programs by which needy countries can receive U.S. food aid: Title I Concessional sales, Title II Donations, and Title III Food for Development.

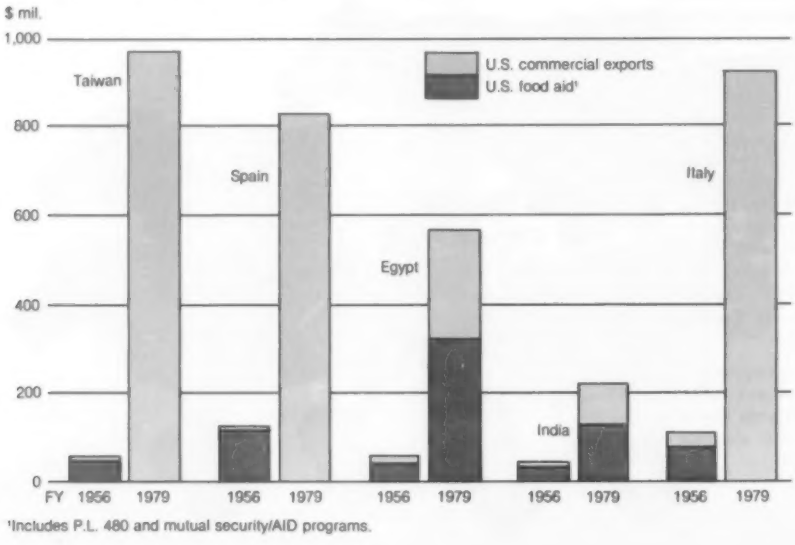
Title I exports totaled $21 billion or about 70 percent of the entire program cost during 1955-1979. This program involved sales for local currencies until 1972 and long-term dollar credit sales at very low interest rates beginning in 1966. Terms for dollar sales generally call for a maximum credit period of 20-40 years.

Commodities under Title I are exported entirely by private U.S. traders with prices the same as for commercial sales.

Title II shipments, which include all food donations, totaled nearly $7 billion or a fourth of all P.L. 480 exports since 1955.

Title II commodities are distributed by non-profit voluntary U.S. agencies—such as Care—international agencies, mainly the World Food Program, and on a bilateral government-to-government

Like Taiwan, Many Big Customers Start with U.S. Food Aid; Others, Like Egypt, Show Progress



¹Includes P.L. 480 and mutual security/AID programs.

basis. Voluntary agencies handle about two-thirds of all Title II exports.

These exports are used for feeding programs, self-help development projects, and disaster relief. They are aimed at low-income groups, including expectant mothers, preschool and school children, and disaster victims abroad.

Title III, or the Food for Development Program, was added to P.L. 480 in 1977. It encourages recipient countries to use the local currency proceeds from the domestic sale of commodities provided under Title I to promote their food and agricultural development, with emphasis on helping the poor. Proceeds used to carry out agreed projects are viewed as partial repayment of Title I debt.

Last year, Title III agreements were signed with Honduras for $4 million over 2 years; with Sudan for $100 million in wheat and flour over 5 years; and with Egypt for $105 million in wheat and flour over 5 years.

Nearly all of our top cash customers once needed U.S. food aid.

In Sudan, proceeds from the sale of the commodities will finance agricultural marketing improvements and rural planning. The proceeds in Honduras and Egypt will be used to improve rural services.

Customers and Friends

While food and other aid does not always win customers—or allies—the record is impressive.

American food relief, combined with development assistance, helped postwar Japan and Western Europe rebuild their economies and strengthened their ties with the U.S. This year, these nations will account for about 45 percent of all U.S. agricultural sales abroad. Japan is our top single customer.

Some developing countries which have graduated from our food aid program to become top cash customers are South Korea—since the early 1970's one of the 10 leading U.S. commercial export customers—Taiwan, and Brazil. During the 1970's, U.S. commercial sales also rose considerably to several current P.L. 480 recipients, such as India, Chile, Peru, Indonesia, the Philippines, and Morocco.

Food aid now being provided for humanitarian reasons may yield similar long-term benefits. When combined with other assistance, it can help poor nations survive shortages and develop a viable economic, political, and agricultural base. Developing economies and rising incomes often translate into expanding markets for U.S. exports.

Crisis in East Africa

U.S. food aid is critical to eastern Africa this year.

Relentless drought has stifled a marginal farm production system, and wars and internal conflicts intensified the problem by uprooting many farmers and creating large refugee communities dependent on outside food.

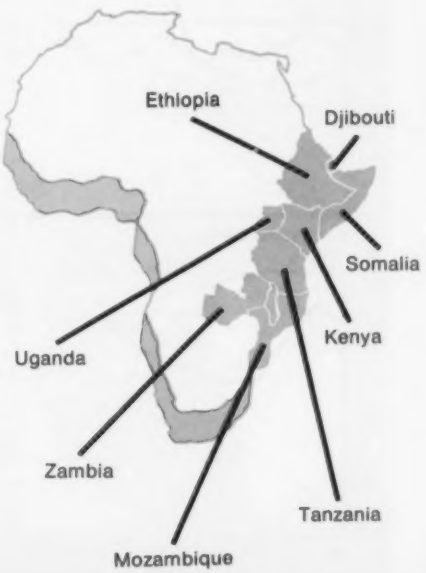
Eight countries—Djibouti, Ethiopia, Somalia, Kenya, Uganda, Tanzania, Zambia, and Mozambique—with a combined population of 95 million face the worst shortages. The Somalia-Ethiopian war created 1.5 million refuges, and the war in Uganda also affected neighboring Tanzania and Kenya.

This year's poor yields produced a devastatingly small harvest, 20 to 30 percent short of demand. USDA estimates that between 1.0 and 1.4 million metric tons of grain are required to meet the minimal consumption needs in eastern Africa.

Of the 1.5 million tons of grain imported by eastern Africa during the year ending this past June, the U.S. supplied over one-third or 588,000 tons—all through the P.L. 480 program.

In addition, a P.L. 480 budget supplemental approved by Congress allowed an extra 150,000 tons of grain to be shipped to eastern Africa, bringing the total U.S. food aid to this region to nearly 750,000 metric tons.

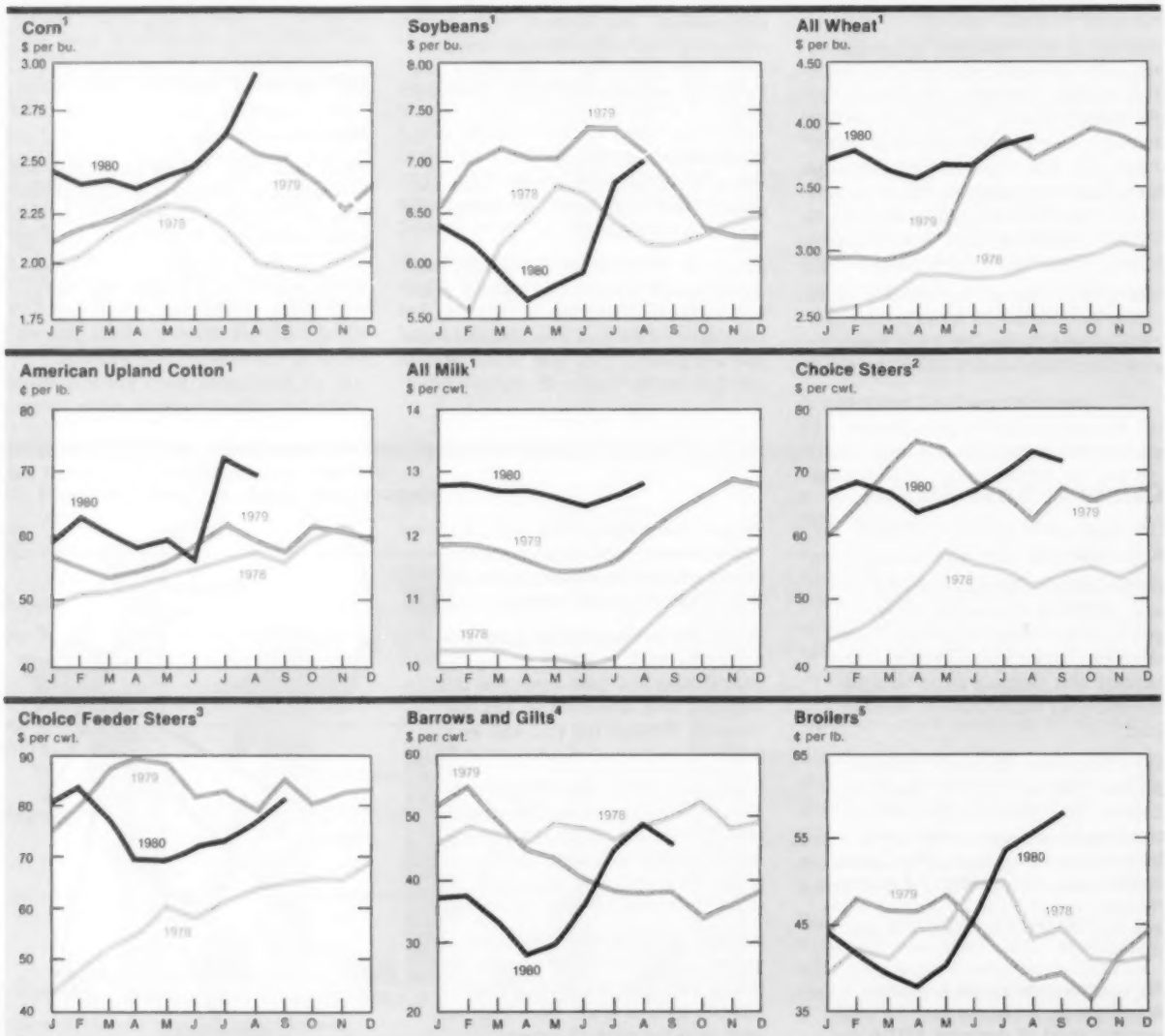
If Congress takes favorable action on the fiscal 1981 P.L. 480 budget, the U.S. will be able to supply 200,000 to 300,000 tons of grain more than last year over the next 12 months.



Farmline Trends

Monthly Price Monitor

Farm prices keep looking stronger. Corn hit $2.93 a bushel in mid-August, a U.S. average price unmatched since 1975. Hog prices recovered to early 1979 levels. Full-month July figures on cotton turned midmonth doldrums into a 16-cent jump--right off last month's chart. And soybean, feeder steer, and broiler prices remained in a steep climb.

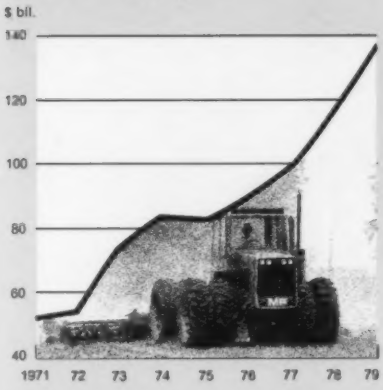


[1]U.S. average prices received by farmers. [2]Omaha. [3]600-700 lbs., Kansas City. [4]Seven-market average. [5]Wholesale, New York. Prices for the latest month shown are mid-month or first week averages.

Adding Up the Farm Production Bill

In a time of steadily rising costs, it comes as no surprise that farmers and ranchers had to lay out more than ever to pay last year's production bill. Recent results of a nationwide survey show that farmers' 1979 production expenditures amounted to $135 billion, about $21 billion more than in 1978. Some of the extra spending went to expand operations and upgrade equipment, but most of it reflects the higher costs of farming. Back in 1971, the total production budget was only $53 billion. (See page 7 for more on survey findings.)

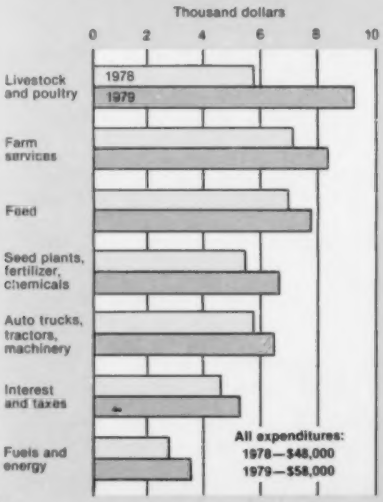
Farm Production Expenditures Continue To Rise



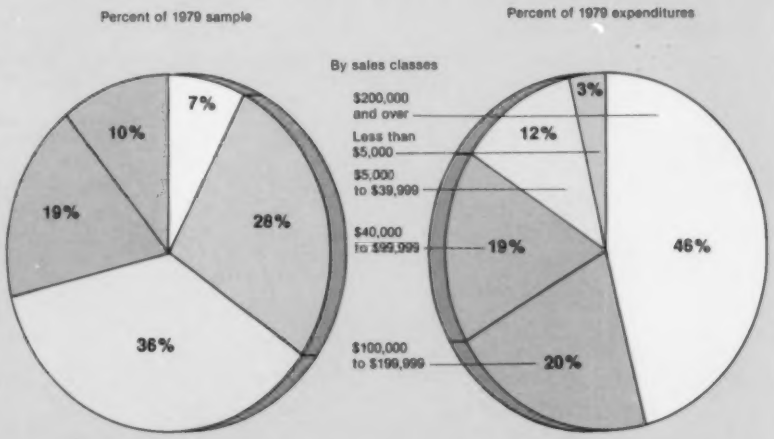
The Farm Production Dollar: Where It Goes[1]

[1]Based on 1979 data.

Average Expenditures Per Farm Were Up About 20% Last Year



. . . But the Top Farms By Sales Paid Nearly Half the Total Bill



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